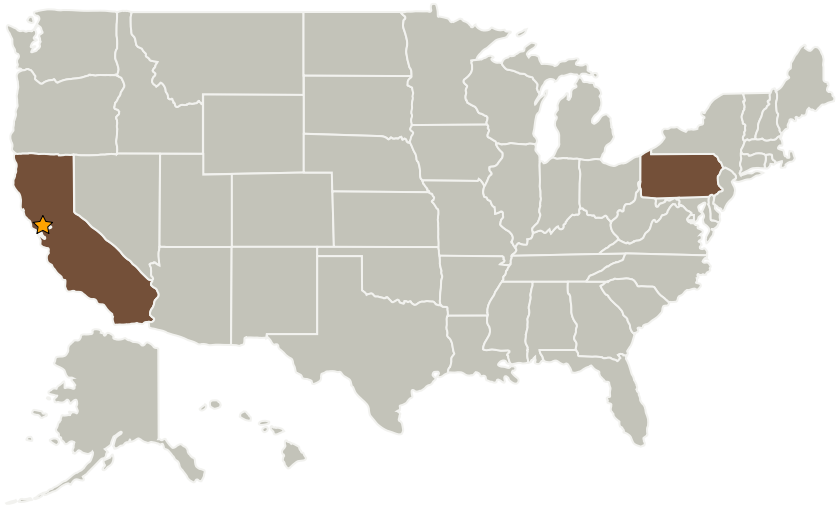
Fully Integral, Flexible Composite Driveshaft, Phase I

Completed Technology Project (2008 - 2008)

Project Introduction

An all-composite driveshaft incorporating integral flexible diaphragms is described and proposed for further refinement. An approach is explored which obsoletes the split lines and associated fasteners required to attach metallic flex elements and either metallic or composite spacing tubes in current solutions. Sub-critical driveshaft weights half that of incumbent technology are projected for typical rotary wing shaft lengths. Spacing tubes are described, which comprise an integral part of the initial tooling but which remain part of the finished shaft and control natural frequencies and torsional stability. A concurrently engineered manufacturing process and design for performance is proposed which competes with incumbent solutions at significantly lower weight and with the probability of improved damage tolerance and fatigue life. This phase I proposal seeks to further remove manufacturing cost and to produce test articles suitable for concept verification and, subsequently, flight qualification during phase II.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Lawrie Technology, Inc.	Supporting Organization	Industry	Girard, Pennsylvania

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations	
California	Pennsylvania

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Duncan J Lawrie

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.3 Mechanical Systems
    - TX12.3.7 Mechanism Life Extension Systems